Elaine Lau

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EDUCATION

MILA, McGill University — **Montreal, Canada**
Master of Computer Science - cGPA: 4.00/4.00 — May 2022 – Present

- Supervised by **Doina Precup;** Focus on improving Generative Flow Networks with the intersection of reinforcement learning
- **Scholarship:** Deepmind M.Sc. Fellowships ($21,000)

Bachelor of Science in Statistics and Computer Science - cGPA: 3.86/4.00 — Sep 2017 – Apr 2022

EXPERIENCE

Valence Labs – Recursion — **Montreal, Quebec**
Machine Learning Researcher Intern — Sep 2023 – Feb 2024

- Conceptualized and led the development of a new method, QGFN; combining a GFlowNet policy with an action-value estimate into mixture policies to achieve better rewards without sacrificing diversity.
- Achieved a 4x increase in performance in several benchmark tasks and submitted the work for conference review.

Scale AI — **San Francisco, California**
Machine Learning Research Engineer Intern — May 2023 – Aug 2023

- Integrated a multimodal model, significantly enhancing the performance of existing small object detection and image retrieval.
- Implemented image similarity search functionality, improving retrieval tasks and enhancing the overall system performance.
- Developed user-friendly endpoints, enhancing system usability, and facilitating adoption by other users.

NVIDIA — **Santa Clara, California**
Data Scientist Intern — Jan 2022 - Apr 2022
Patent - Heuristic-Systematic Decision-Making model for User Feedback Based on User Behavior and System Telemetry.

- Designed a decision-making model that detects usefulness of user feedbacks in GeForce Now (GFN) Cloud Gaming Service.
- Integrated an end-to-end pipeline in GFN data science team to improve the efficiency and productivity in examining feedback.
- Conducted statistical analysis of trends and relationships of user behavior and system telemetry in designing heuristic functions.

Vector Institute — **Toronto, Ontario**
Applied Machine Learning Intern — Sep 2021 - Dec 2021

- Designed an end-to-end generative empathetic chatbot that can automate a customer support service using GPT-2, BERT.
- Investigation in knowledge infusion, modifications on loss functions, inference techniques and different evaluation metrics.
- Finetuned BERT with masked language modelling and classification in downstream task.

PUBLICATIONS

Elaine Lau, Stephen Zhewen Lu, Ling Pan, Doina Precup, Emmanuel Bengio, "QGFN: Controllable Greediness with Action Values". **Under review** [arXiv][Github]

Elaine Lau, Nikhil Vemgal, Doina Precup, Emmanuel Bengio, "DGFN: Double Generative Flow Networks". **NeurIPS 2023 Workshop** [arXiv]

Nikhil Murali Vemgal, **Elaine Lau**, Doina Precup, "An Empirical Study of the Effectiveness of Using a Replay Buffer on Mode Discovery in GFlowNets". **ICML 2023 Workshop** [arXiv]

Flemming Kondrup*, Thomas Jiralerspong*, **Elaine Lau*,** Nathan de Lara, Jacob Shkrob, MD Tran, Doina Precup, Sumana Basu. "Deep Conservative Reinforcement Learning for Personalization of Mechanical Ventilation Treatment". **AAAI-IAAI 2023, 1st place** in **ProjectX** Research Competition *** co-first author** [arXiv]

David Venuto, **Elaine Lau**, Doina Precup, Ofir Nachum. "Policy Gradients Incorporating the Future". **ICLR 2022** [arXiv]

Stephen Obadinma, Faiza Khan Khattak, Shirley Wang, Tania Sidhom, **Elaine Lau**, Sean Robertson, Jingcheng Niu. "Bringing the State-of-the-Art to Customers: A Neural Agent Assistant Framework for Customer Service Support". **EMNLP 2022 Industry** [arXiv]

TECHNICAL SKILLS

Programming	Python, Java, C, R, Ocaml, JavaScript, MATLAB, SQL
Frameworks & Tools	PyTorch**,** TensorFlow, Pandas, Matplotlib, Flask, Scikit-Learn, AWS, Azure, Git, Tableau, DBeaver
Relevant Coursework	Natural Language Processing, Computer Vision, Applied Machine Learning, Database Systems, Time Series Analysis, Generalized Linear Models, Stochastic Process, Introduction to Data Science
Teaching Assistant	Programming Languages and Paradigms, Natural Language Processing, Applied Machine Learning
Language	English, Mandarin, Cantonese